UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/676,644	09/29/2000	Hitoshi Honda	450100-02738	3222

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FROMMER LAWRENCE & HAUG
745 FIFTH AVENUE- 10TH FL.
NEW YORK, NY 10151

EXAMINER
LERNER, MARTIN

ART UNIT	PAPER NUMBER
2654	

DATE MAILED: 06/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 to 9* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 to 9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>6</u>.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Specification

1.   The title of the invention is not descriptive. A new title is required that is clearly

indicative of the invention to which the claims are directed.

The following title is suggested:

Speech Recognition with Feedback from Natural Language Processing

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly
claiming the subject matter which the applicant regards as his invention.

3.   Claims 3 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

It is not clear what the scope is of the term "speech recognition result zones" of

claims 3 and 7. The term is not expressly defined by the Specification, the meaning of

the term is not clear from the context as described on Pages 21 to 25 of the

Specification, Figures 6 to 7, and there is no art recognized meaning for the term. One

having ordinary skill in the art would not readily understand the scope of the term

"speech recognition result zones."   Do the "speech recognition result zones" represent

places within a dialogue where correct or incorrect speech recognition results are

obtained? How do the "speech recognition result zones" differ from speech recognition results that are correct or incorrect, as per claim 4?

It is unclear whether the "at least one of" language of claim 7 refers to only the speech recognition result zones, or all of the enumerated speech recognition result zones which are to be used for the adaptation of models, the speech recognition result zones which are not to be used for the adaptation of models, the speech recognition result which appears to be correct, the reliability of the speech recognition result, and a task of the speech recognition result. That is, the claim is indefinite because it is unclear whether the claim requires all of the recited alternatives to be disclosed by the prior art, or only one of the recited alternatives to be disclosed by the prior art. For purposes of examination, it is presumed the claim was intended to recite any one of the enumerated alternatives. The claim can be clarified by changing "wherein said feedback means feeds back at least one of" to --comprising feeding back at least one of--.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5.   Claims 1, 8, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by

Fu Qiuliang et al. *("Chinese word recognition and understanding with information*

feedback").

Regarding independent claims 1, 8, and 9, *Fu Qiuliang et al.* discloses a speech

processing apparatus, method, and program, comprising:

"speech recognition means for performing speech recognition" – speech

recognition system (Figure 1: Page 738); syllable-char transform and word

understanding blocks (Figure 2: Page 738);

"natural-language processing means for performing natural language processing

on a speech recognition result obtained from said speech recognition means" –

understanding system according to linguistic rules (Figure 1: Page 738); phrase

understanding and sentence understanding blocks according to linguistic rule set

(Figure 2: Page 738); "natural language" is defined as a human spoken or written

language as opposed to a computer language (The American Heritage® Dictionary of

the English Language); "natural language processing" involves the understanding and

generation of natural human language by a computer with computational linguistics

(Encarta® World English Dictionary, North American Edition); thus, understanding

according to linguistic rules is "natural language processing"; first, the system compares

the creative language with the understanding language, corrects the mistake by itself in

the basis of linguistic rule set, and extract the final result (Page 738);

"wherein said natural-language processing means comprises feedback means

for feeding back information obtained as a result of the natural language processing

performed on the speech recognition result to said speech recognition means, and said

speech recognition means comprises process means for performing processing based

on the information fed back from said feedback means" – information feedback block

(Figure 1: page 738); information feedback block (Figure 2: Page 738); second, the

system could get a few information from the correcting processing, that can be

controlled to the next processing of understanding, and may influence the next process,

that includes understanding processing; this kind of feedback processing of speech

recognition and understanding is illustrated; Figure 1 clearly shows feedback is provided

both to (speech) recognition system ("speech recognition means") and (speech)

understanding system ("natural language processing means").

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

7.   Claims 2, 4, 5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable

over *Fu Qiuliang et al.* in view of *Nguyen et al.*

Regarding claim 2, *Fu Qiuliang et al.* does not expressly disclose the speech

recognition is performed by using "models", and adaptation is performed on "models"

based upon the information fed back, although those skilled in the art know that models

are the most common means for representing and adapting speech recognition units.

Nguyen et al. teaches speech recognition with supervised adaptation, where recognizer

10 operates in conjunction with a set of speech models 12. The adaptation system

adapts these models based on supervised adaptation data supplied as input by a new

speaker. Recognizer 10 employs Hidden Markov Models to represent each of the

sound units (e.g., words) within the recognizer's lexicon. Models for recognition and

adaptation are the most popular way to represent sound units. (Column 2, Lines 44 to

55: Figure 1) It would have been obvious to one having ordinary skill in the art to use

models for recognition and adaptation of speech in the word recognition and

understanding with information feedback method of Fu Qiuliang et al. as taught by

Nguyen et al. because models for recognition and adaptation are the most popular way

to represent sound units.

Regarding claims 4 and 5, Fu Qiuliang et al. discloses feedback, but does not

expressly disclose feeding back the speech recognition result which appears to be

correct and a reliability of the speech recognition result. However, Nguyen et al.

teaches speech recognition with supervised adaptation, where weights are assigned to

transcriptions during adaptation corresponding to their likelihoods, and reliable

information corresponding to correct labels becomes enhanced by a positive weight and

unreliable information is correspondingly diminished in importance because of a

negative weight applied. (Column 3, Lines 31 to 56: Figure 2) Thus, Nguyen et al.

suggests adaptation of speech recognition models by feeding back correct speech

recognition results with positive reliability weights. The stated advantage of the

corrective adaptation procedure in comparison with other discriminative methods is that

it is computationally inexpensive and easy to implement. (Column 2, Lines 11 to 28) It

would have been obvious to one having ordinary skill in the art to feed back reliability

information for speech recognition results that appear to be correct as suggested by

Nguyen et al. in the word recognition and understanding with information feedback

method of *Fu Qiuliang et al.* for the purpose of obtaining corrective adaptation that is

computationally inexpensive and easy to implement.

Regarding claim 7, *Nguyen et al.* suggests adaptation of speech recognition

models by feeding back correct speech recognition results with positive reliability

weights, as discussed above.

8.   Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Fu Qiuliang et al. in view of *Bub ("Task adaptation for dialogues via telephone lines")*.

Regarding claims 2 and 3, *Fu Qiuliang et al.* discloses feedback, but omits

feedback based upon speech recognition result zones which are to be used for the

adaptation of models and speech recognition result zones which are not be used for the

adaptation of models. However, *Bub* teaches task adaptation of models for dialogues,

where in case an error is detected, good utterances are selected for adaptation by

means of a statistical rejection strategy. If a rejection flag equals 1, the corresponding

utterance will be omitted by the adaptation algorithm, but if a rejection flag equals 0, the

corresponding utterance will be adapted. Thus, adaptation is done on cleaner data than

without rejection because the hypothesis is above a threshold. (Page 827: 3.2

Rejection) Here, "speech recognition result zones" correspond to utterances with

rejection flags of 0 or 1. Adaptation is only performed for utterances where the rejection

flag is 0, and adaptation is not performed for utterances where the rejection flag is 1. It

would have been obvious to one having ordinary skill in the art to perform adaptation

only on utterances where a rejection flag is 0 for the purpose of better corrective

adaptation of recognition errors only when the data is above a threshold.

9.   Claims 2 and 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Fu

Qiuliang et al.* in view of *Matsunaga et al. ("Task adaptation in stochastic language

models for continuous speech recognition")*.

        Regarding claims 2 and 6, *Fu Qiuliang et al.* discloses feedback, but does not

expressly disclose feeding back the speech recognition result based upon a task for

adaptation of models. However, *Matsunaga et al.* teaches adaptation of speech

recognition models based upon a target task. The stated advantage is that speech

recognition accuracy is increased by adaptation using models similar to the recognition

task. (Page I-165) It would have been obvious to one having ordinary skill in the art to

adapt a speech recognition model according to a particular task as suggested by

Matsunaga et al. in the word recognition and understanding with information feedback

method of *Fu Qiuliang et al.* for the purpose of increasing speech recognition accuracy.

Conclusion

10.   The prior art made of record and not relied upon is considered pertinent to

Applicants' disclosure.

Fu Qiuliang et al. ("A close ring structure of speech recognition and

understanding"), Masataki, Junqua ('181), Junqua et al. ('257), Crespo et al.,

Vanbuskirk et al., Morin et al., and *Franz et al.* disclose related art.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Martin Lerner whose telephone number is (703) 308-

9064. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to
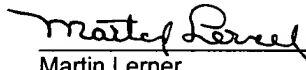
Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Richemond Dorvil can be reached on (703) 305-9645. The fax phone

number for the organization where this application or proceeding is assigned is 703-

872-9306.

Information regarding the status of an application may be obtained from the

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published applications may be obtained from either Private PAIR or Public PAIR.

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

ML
6/1/04

Martin Lerner
Examiner
Group Art Unit 2654